EX PARTE OR LATE FILED

Uniplex
CORPORATION

October 20, 1994

William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, NW Room 222
Washington, DC 20554

Re: NPRM 93-61 Ex Parte

On October 19, 1994 I met with Ron Netro of the Private Radio Bureau to discuss band plan issues relative to the above matter.

I am enclosing two copies of materials which were left with attendees of the meeting.

Sincerely,

UNIPLEX CORPORATION

McNeil Bryan

President

2905 COUNTRY DRIVE • ST. PAUL, MN 55117 • 612/490-1936 • FAX 612/490-0495

GeoNet™

By Uniplex® Corporation

The Uniplex GeoNet Wireless Distributed Intelligence Location and Communications Network (WDILCN) consists of an array of fixed point spread spectrum transceivers linked to a central network management computer which is in turn linked to multiple customer computers. Mobile and portable devices use the network array to communicate location and other data with their respective customer computers.

The GeoNet system is unique in that instead of storing current and historical location data in a central database or customer database, each GeoNet Mobile or portable computes and stores its own location histogram. This requires that fixed stations periodically transmit a "Token" data packet among themselves which mobiles overhear and use to compute their position. In the process of measuring timing differences between fixed points for position determination, the mobiles also receive outbound messages or service requests, road traffic updates, the relative signal strength of nearby fixed points and other network protocols without creating any inbound radio traffic unless requested.

To accomplish radiolocation passively, the system requires an overhead of 5-10% of total system time to assure a reasonable chance that mobiles within the coverage area receive 3 or more pairs of fixed points during the Token passing session. To initiate a service request or reply to one, a mobile establishes contact with the fixed point having the strongest signal during the last Token passing session. Thus, mobile power requirements are less than narrowband forward link systems which must reach multiple fixed points for multilateration.

Although the Token passing overhead may seem high from our system perspective, from an interference point of view, any fixed point transmitter will not likely have a duty cycle greater than 1:100. Additionally, at least for some classes of potential customers, a distributed intelligence system like GeoNet results in superior service with far less radio traffic than would be necessary with a central intelligence system.

Consider the case of a metropolitan transportation system with 500 buses. If the requirement is that central dispatch be alerted to all instances of busses running 2 minutes or more off schedule, a central intelligence system would have to query all 500 buses every 2 minutes. With the Uniplex GeoNet distributed intelligence system, each bus would have its own on-board computer with it's stored schedules. Every 20 seconds or so, when a position fix is received, it would make an on-time determination and only report behind schedule by exception to the central dispatch.

A home prisoner monitoring bracelet could operate in a similar manner when miniaturized low power consumption hardware is developed. Presently such systems consist of low power transmitters worn as a leg or arm bracelet and a home unit that simply reports via telephone that the person has gone out of range. Courts are reluctant to sentence many cases to this type of system because there is no control of the person's whereabouts when he leaves home for an authorized period to go to work, attend AA meetings etc.

With the GeoNet distributed intelligence approach, the prisoner's bracelet would be loaded with his weekly itinerary which would be periodically compared with position fixes obtained from GeoNet. Should the prisoner deviate from the allowed schedule he will be warned by the bracelet and the bracelet, in turn will report the exception via the GeoNet network.

© 1994 Uniplex Corporation •2905 Country Drive •St. Paul, MN 55117 •612-490-1936 Fax 612-490-0495

GeoNet System Parameters

Fixed Site Antenna Spacing	1-3 miles urban 10-15 miles suburban/rural
Signal Characteristics Base and Mobile	
Bandwidth	8 MHz
Chip Rate	4 MHz
Code Length	127 Chips
Modulation	QPSK Two Bits Per Symbol 31.25 KHz Symbol Rate
Data Rate	19.2 KBd
Design Receive Level	-110 dbm (Quiet) -95 dbm (Normal Background Noise)
Packet Structure	5 ms Preamble (Chip Code) 16 to 1024 Byte Data packet Including Overhead
Interference Avoidance	CSMA and Course TDMA
Error Management	CRC and Byte Check
Min Fixed Sites For Location Fix	3 Pairs (Passive Hyperbolic Multilateration)

Fixed Station Parameters

Typical Antenna Height	50-300 ft
Power	6-300 Watts EIRP Adaptive Power Control
Transmit Duration	7-21 ms
Transmit Periodicity/Site	3-6 Every 30 Seconds Token Passing Full Power 1/Hr Nearest Mobile, Adaptive Power Control

Mobile/Portable Parameters

Power	20 Watts
Antenna Gain	-3 dbi to +6 dbi
Transmit Duration	7-21 ms
Periodicity	0 to 1/Hr est.